

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

January 4, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

FROM: Dana Dean, P.E., Senior Reclamation Specialist

RE: 2004 Third Quarter Water Monitoring, Plateau Mining Company, Willow Creek Mine, C/007/0038-WQ04-3, Task #2041

1. Was data submitted for all of the MRP required sites? YES ☒ NO ☐

Identify sites not monitored and reason why, if known:

2. On what date does the MRP require a five-year resampling of baseline water data.

See Technical Directive 004 for baseline resampling requirements. Consider the five-year baseline resubmittal when responding to question one above. Indicate if the MRP does not have such a requirement.

Resampling due date

There is no commitment in the MRP to resample for baseline parameters.

3. Were all required parameters reported for each site? YES ☒ NO ☐

Comments, including identity of monitoring site:

4. Were irregularities found in the data?

YES ☒ NO ☐

Comments, including identity of monitoring site:

The total iron at B3N (42.2 mg/L) was 3.23 standard deviations above the mean of 6.82 mg/L. The only other iron value above 15 mg/L was recorded in March 2003 at 38.1 mg/L. The high iron value at that time was attributed to the high snowmelt runoff. The total iron value has fluctuated up and down since sampling began and does not correlate at all with flow rates.

There is no primary drinking water quality standard for iron, the secondary standard is 0.3mg/L. The majority of samples taken from the site (18 of 31) are higher than 0.3 mg/L. The same number of samples was greater than the suggested 0.2 mg/L for industrial use. The sample value was greater than the toxic threshold for aquatic life of 1mg/L in 14 of 31 samples. Therefore the high iron reading during the third quarter of 2004 does not reflect a degradation in the available uses of the water, since the iron value has always been above recommended standards.

Total suspended solids at B3N (944 mg/L) were 2.80 standard deviations above the mean of 222.13 mg/L. This is the highest TSS value ever recorded at the sight. The level has fluctuated quite a bit in the past, but does not seem to correlate well with flow.

The dissolved potassium reading at B3N (5.2 mg/l) was 2.44 standard deviations above the mean of 2.73 mg/l. Since the standard deviation is quite small for this parameter, the fact that this sample is outside that range is not surprising or alarming. There is no drinking water quality standard for potassium, and it is an element often added to water through water softening systems (up to 533mg/l added by softeners).

The total alkalinity at B3N (360 mg/l) was 2.05 standard deviations above the mean of 278.52 mg/l. This value has also fluctuated up and down and has a slight upward trend. The higher alkalinity is a positive change to the water, since it provides a greater buffering capacity. This buffering capacity protects against rapid pH changes.

The dissolved oxygen readings at B5 (12.1 mg/l), B6 (12.1 mg/l), and B151 (11.7 mg/l) were all somewhat higher than expected.

Several routine reliability checks were outside of standard values. They were:

Site	Reliability Check	Value Should Be...	Value is...
B3N	Cation/Anion Balance	<5%	8.3%
B3N	TDS/Conductivity	>0.55 & <0.75	0.79
B3N	Conductivity/Cations	>90 & <110	77
B3N	Mg/(Ca + Mg)	< 40 %	52%

B3N	Ca/ (Ca + SO4)	> 50 %	48%
B5	TDS/Conductivity	>0.55 & <0.75	0.53
B5	Mg/(Ca + Mg)	< 40 %	48%
B6	TDS/Conductivity	>0.55 & <0.75	0.53
B6	Mg/(Ca + Mg)	< 40 %	48%
B151	TDS/Conductivity	>0.55 & <0.75	0.93
Site	Reliability Check	Value Should Be...	Value is...
B151	Conductivity/Cations	>90 & <110	59
B151	Mg/(Ca + Mg)	< 40 %	55%
B151	Ca/ (Ca + SO4)	> 50 %	49%

The Permittee should work with the lab to make sure that samples pass all quality checks so that the reliability of the samples does not come into question. These inconsistencies do not necessarily mean that a sample is wrong, but it does indicate that something is unusual. An analysis and explanation of the inconsistencies by the Permittee would help to increase the Division's confidence in the samples. One reference the Permittee may read to learn more about these reliability checks and some of the geological and other factors that could influence them is Chapter 4 of *Water Quality Data: Analysis and Interpretation* by Arthur W. Hounslow.

5. Were DMR forms submitted for all required sites?

1st month, YES ☒ NO ☐
2nd month, YES ☒ NO ☐
3rd month, YES ☒ NO ☐

All DMRs reported "no flow".

6. Were all required DMR parameters reported?

YES ☒ NO ☐

Comments, including identity of monitoring site:

All DMRs reported "no flow".

7. Were irregularities found in the DMR data?

YES ☐ NO ☒

Comments, including identity of monitoring site:

All DMRs reported "no flow".

8. Based on your review, what further actions, if any, do you recommend?

No actions are necessary at this time.

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